SECTION 16452

GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of grounding work is indicated by drawings, schedules and as specified herein.

B. Types of grounding specified in this section include the following:

1. Solid grounding.

C. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications.

PART 2 - PRODUCTS

2.1 GROUNDING SYSTEMS

A. Materials and Components:

1. General: Except as otherwise indicated, provide electrical grounding systems indicated; with assembly of materials, including, but not limited to, cables/wires, connectors, terminals (solderless lugs), grounding rods/electrodes and plate electrodes, bonding jumper braid and additional accessories needed for complete installation. Where more than one type unit meets indicated requirements, selection is Installer's option. Where materials or components are not indicated, provide products complying with NEC, UL, IEEE and established industry standards for applications indicated.

B. Conductors: Provide copper electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC. All conduits shall contain a minimum of one (1) separate equipment grounding conductor identified and sized according to NEC.

C. Bonding Jumper Braid: Copper braided tape, constructed of 30-gage bare copper wires and properly sized for indicated applications.

D. Flexible Jumper Strap: Flexible flat conductor, 480 strands of 30-gage bare copper wire; 3/4-inch wide, 9-1/2-inches long; 48,250cm. Protect braid with copper bolt hole ends with holes sized for 3/8-inch dia. bolts.

E. Bonding Plates, Connectors, Terminals and Clamps: Provide electrical bonding plates, connectors, terminals, lugs and clamps as recommended by bonding plate, connector, terminal and clamp manufacturers for indicated applications.

F. Ground Rods and Bars:

1. Ground Rods: Steel with copper welded exterior, 5/8-inch dia. x 8-feet (Unless otherwise noted).

2. Ground Bars: Sheet copper bar 1/4" thick x 4" wide x 4' long, 20-gage x 36-inch x 36-inch, with two (2) cable attachments for 500 KCMIL.

G. Electrical Grounding Connection Accessories: Provide bar tap bottom lugs, irreversible compression lugs, electrical insulating tape, heat-shrinkable insulating tubing, welding materials, bonding straps, as recommended by accessories manufacturers for type services indicated.

H. Exothermic Welded Connections: Comply with AWS Code for procedures, appearance, and quality of welds; and methods used in correcting welding work. Provide welded connections where grounding conductors connect to underground grounding rods/electrodes.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer must examine areas and conditions under which electrical grounding connections are to be made and notify Contractor in writing of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION OF ELECTRICAL GROUNDING

A. General: Install electrical grounding systems where shown, in accordance with applicable portions of NEC, with NECA's "Standard of Installation" and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.

B. Provide concrete encased grounding electrode and cable system as detailed on the drawings.

C. Coordinate with other electrical work as necessary to interface installation of electrical grounding system with other work.

D. Weld grounding conductors to underground grounding rods/electrodes. (Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable).

E. Install clamp-on connectors only on thoroughly cleaned metal contact surfaces, to ensure electrical conductivity and circuit integrity.

3.3 FIELD QUALITY CONTROL

A. Upon completion of installation of electrical grounding systems, test ground resistance with ground resistance tester. Where tests show resistance to ground is over 5 ohms, take appropriate action to reduce resistance to 5 ohms or less, by driving additional ground rods and/or by chemically treating soil encircling ground rod; then retest to demonstrate compliance.

END OF SECTION